ON THE APERTURE OF A BACULITE FROM THE LOWER CHALK OF CHARDSTOCK, SOMERSET.

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In 1876 Meek[1] pointed out that the genus *Baculites*, as usually understood, seemed to be divisible into at least two sections, according to the nature of the aperture. In one division the aperture is directed forwards, as in *Baculites vertebralis*, Lam.; in the other it opens towards the antisiphonal side, as in *Baculites baculoides* (Mantell).

Meek restricted the name *Baculites* to the former division, and proposed for the latter section the name *Cyrtochilus*, observing that "the direction of its aperture, and the curvature of the projection of the siphonal margin of its lip, are such, that the head of the animal, and other parts connected therewith, must have been protruded at right angles to the longitudinal direction of the shell instead of on a line with the same—a peculiarity that was probably accompanied by important differences in the structure and habits of the animal." Meek's views, however, with regard to the division of *Baculites* do not seem to have met with general acceptance.

As the type of his *Cyrtochilus*, Meek selected *Baculites baculoides* (Mantell). The specimens hitherto figured showing this form of aperture have usually been referred to Mantell's species. In describing this fossil in 1822 Mantell[2] placed it in the genus *Hamites*. The two specimens which he figured are now in the British Museum, but neither of them show any trace of the aperture, although a considerable portion of the body-chamber is preserved in each.

Several authors have, however, since figured the aperture of specimens which they have referred to Mantell's species; still, examples showing the aperture are by no means common.

The earliest figure appears to be that given by James de Carle Sowerby[3] in his "Mineral Conchology" in 1828. Under the name *Baculites obliquatus*, which he regarded as identical with *Hamites baculoides*, Mantell, he figures and describes an example as "an unique specimen, that shows the form of the aperture, which is placed obliquely; on each side is a large oval lobe, placed anteriorly and bent backward." This specimen is now in the British Museum Collection. It was without doubt this same specimen that Mantell

[1] "United States Geol. Surv. of the Territories," vol. ix, pp. 392–3.

[2] "Foss. S. Downs," 1822, p. 123, pl. xxiii, figs. 6 and 7 (B.M. Nos. 8,612 and 36,576 respectively).

[3] "Mineral Conchology," vol. vi, p. 186, pl. dxcii, fig. 2 (B.M. No. 44,005).

figured (and somewhat restored) in 1833 in his "Geology of the South-east of England,"[1] under the name *Baculites obliquatus*; and that he more correctly depicted in 1844 in his "Medals of Creation"[2] as *Baculites baculoides*.

In 1842 D'Orbigny[3] gave figures of the aperture of a specimen which he referred to this species in his "Paléontologie Française," and in 1876 Schlüter[4] figured and referred to this species a specimen showing the aperture.

The best figures and description of the aperture known to the present writer were given in 1885 by Noetling,[5] who depicted both a lateral aspect and a view of the aperture from above.

The specimen of *Baculites* from the Isle of Wight, figured by Norman[6] in 1887, shows the curved portion of the siphonal area of the shell in the region of the aperture, but no traces of the margin of the aperture.

In the British Museum there is an example (No. C. 422) probably belonging to this species from the Lower Chalk of Chardstock, Somerset, which, though only a natural cast of the anterior portion of the body-chamber, nevertheless shows the aperture so remarkably well as to be deserving of notice.

The specimen is 46 mm. long, is laterally compressed, and in cross-section is oval. The greatest thickness of the body-chamber is at the posterior margin of the aperture, its dorso-ventral and transverse diameters here being 15·5 and 13·5 mm. respectively. The aperture, subelliptical in outline, is 25 mm. in length by 14 mm. wide, and is only slightly inclined to the longitudinal axis of the shell. Anterior to the posterior margin of the aperture, the body-chamber gradually decreases in width, and is somewhat narrower than the aperture itself. The anterior portion of the body-chamber for a length of about 5 mm. is very much more compressed than the rest, and has only a width of about 4·5 mm.

In the neighbourhood of the aperture the siphonal area of the body-chamber curves towards the antisiphonal, but its anterior portion, *i.e.* a length equal to about one-fifth of the entire length of the aperture, instead of following the curve of the rest of the siphonal area, turns abruptly forward in a direction almost parallel to the longitudinal axis of the shell; and since the shell here is much more compressed laterally than it is at the adjacent parts, the anterior portion of the aperture has therefore a spout-like appearance.

The siphonal portion of the body-chamber adjoining the aperture exhibits five coarse folds imbricating forwards, that gradually become

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[1] "Geology S.E. of England," 1833, p. 160, fig. 1.

[2] "Medals of Creation," 1844, vol. ii. p. 499, lign. 110, fig. 2.

[3] Pal. Franç. Terr. Crét., vol. i, pl. cxxxviii, figs. 6, 8, 9. Referred since by Geinitz to a distinct species, *B. subbaculoides*.

[4] "Palæontographica," vol. xxiv, 1876, pl. xxxix, fig. 15.

[5] "Die Fauna der Baltischen Cenoman-Geschiebe," Paläont. Abhandl., Dames and Kayser, vol. ii, pt. 4, p. 42, pl. viii (xxiii), figs. 7, 7*a*.

[6] "Popular Guide to the Geology of the Isle of Wight," 1887, plate facing p. 96.

more pronounced towards the anterior portion; the anterior side of each is steep and only 1·5 mm. in length, but the posterior side is feebly inclined to the longitudinal axis and is about 4 mm. in length. In passing round to the sides these folds curve gently backwards, and gradually disappear at about the centre of the lateral area. With the exception of the anterior one, these folds pass uninterruptedly over the siphonal area. The anterior fold is, however, flattened at the middle of the siphonal area, and passes laterally on to the everted margin of the aperture. A yet more feeble ridge or fold arises on either side of the median portion of the anterior spout-like projection, and passes round, over the lateral area, parallel to the other folds, to the margin of the aperture.

On the antisiphonal area immediately behind the aperture there is a constriction about 4 mm. wide, having its greatest depth (1 mm.) close under the margin of the aperture; in passing round to the sides, this is only about 2 mm. wide, and keeping close to the margin reaches across about one-third of the lateral area.

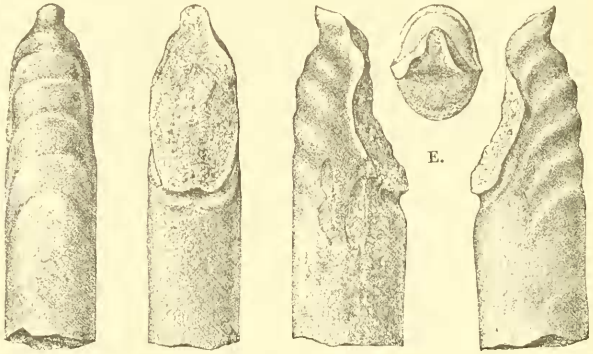
The margin of the aperture is not quite perfect; but where one side is incomplete, the other side, fortunately, is well preserved, so that by a comparison of the two sides, the original form of the entire margin can be ascertained. On the antisiphonal and lateral areas the margin is somewhat thickened and everted. In the central line of the antisiphonal area, the margin projects slightly forwards and outwards, forming a blunt antisiphonal apophysis about 1 mm. long. Starting from this apophysis, the margin, as seen in a lateral aspect, first curves backwards and towards the siphonal side, over about one-third of the width of the lateral area; then, after passing forwards with but a slight inclination to the longitudinal axis of the shell, it forms a broad curve having its convexity towards the siphonal side, the deepest part of the curve being at about the middle of the lateral area; then, having curved towards the antisiphonal area to a point distant from that area about one-third of the ventro-dorsal diameter, the margin curves somewhat abruptly towards the siphonal side to meet the most anterior projecting portion of the siphonal area. The lateral lappet thus formed is separated from the corresponding lappet on the opposite side by a narrow horseshoe-shaped sinus 4·5 mm. wide.

The principal difference between this specimen and those previously figured consists in the prolongation of the siphonal margin of the aperture into a spout-like projection.

An examination of Sowerby's figured specimen, now in the British Museum Collection (No. 44,005), shows that the anterior extremity is abraded, so that if any spout-like projection were originally present, it has been broken off. Noetling's figure is so similar to Sowerby's that it is not at all improbable the lack of any such projection in his specimen may be due to the same cause.

The projection indicates the position of the funnel. Its relative smallness, and therefore the smallness also of the latter, indicate an animal with crawling rather than free-swimming habits. In the case of such an animal with a long (and in the adult, straight) shell, when

crawling the latter would probably have an oblique direction, and hence the aperture would naturally be oblique to the longitudinal axis of the shell.



Baculites baculoides? (Mantell).

Lower Chalk: Chardstock, Somerset.

A. Siphonal aspect. B. Antisiphonal aspect. C. Left lateral aspect. D. Right lateral aspect. E. Aspect from above.